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Heiner Scheer

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EXAMINER

DAM, DUSTIN Q

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/519,117	Applicant(s) SCHEER ET AL.	
	Examiner DUSTIN Q. DAM	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/22/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. This is the initial Office Action based on the Sensor Element for Determining the Concentration of a Gas Component in a Gas Mixture filed on July 4, 2003.
2. Claims 11-21 are currently pending and have been fully considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 11-13 and 17 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by SUGIYAMA et al. (U.S. Patent 5,787,866).

- a. With regards to claim 11, SUGIYAMA et al. discloses a sensor element for determining a concentration of a gas component in a gas mixture comprising a laminated body including a plurality of solid electrolyte layers, the plurality of solid electrolyte layers including an upper layer (210, FIG. 2), a lower layer (110, FIG. 2), and an intermediate layer (36, FIG. 2), each of the upper and lower layers including a ceramic film (line 43, column 4 & see line 60, column 4 "zirconia"), the upper and lower layers having an equal thickness (line 54-57, column 5 and line 64, column 5), the intermediate layer including at least one film binder layer (line 10-18, column 6 "zirconia").

Art Unit: 1795

b. With regards to claim 12, SUGIYAMA et al. discloses a sensor element wherein the element is structurally capable of determining a concentration of oxygen in an exhaust gas of an internal combustion engine (line 5-13, column 1). Regarding claims which contain various process or intended use limitations which do not further delineate the structure of the claimed apparatus from the structure of the prior art, because these claims are drawn to an apparatus statutory class of invention, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus itself. These recited process or use limitations are accorded no patentable weight to an apparatus. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is Capable of performing the intended use, then it meets the claim. See *In re Casey* 152 USPQ 235 (CCPA 1967); and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). The Courts have held that it is well settled that the recitation of a new intended use, for an old product, does not make a claim to that old product patentable. See *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The Courts have held that apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. See *In re Danly* 120 USPQ 528, 531 (CCPA 1959); and *Hewlett-Packard Co. v. Bausch and Lomb, Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). The courts have held that expressions relating the apparatus to contents thereof during an intended operation are of no significance in

Art Unit: 1795

determining patentability of the apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (BPAI 1969). The courts have held that inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims. See *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)). The Courts have held that the manner of operating an apparatus does not differentiate an apparatus claim from the prior art, if the prior art apparatus teaches all the structural limitations of the claim. See *Ex parte Masham*, 2 USPQ2d 1647 (BPAI 1987) (see MPEP § 2114).

c. With regards to claim 13, SUGIYAMA et al. discloses a sensor element wherein the at least one film binder layer is disposed on one of the films for the upper and lower layers (as 36 is disposed on 110, FIG. 2). Regarding claims which contain various process or intended use limitations, such as “printed” which do not further delineate the structure of the claimed apparatus from the structure of the prior art, because these claims are drawn to an apparatus statutory class of invention, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus itself. These recited process or use limitations are accorded no patentable weight to an apparatus. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is Capable of performing the intended use, then it meets the claim.

Art Unit: 1795

d. With regards to claim 17, SUGIYAMA et al. discloses a sensor element wherein the upper layer includes a gas entry hole (913, FIG. 10) that completely penetrates the upper layer. Regarding claims which contain various process or intended use limitations, such as “made before a lamination of the laminated body” which do not further delineate the structure of the claimed apparatus from the structure of the prior art, because these claims are drawn to an apparatus statutory class of invention, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus itself. These recited process or use limitations are accorded no patentable weight to an apparatus. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is Capable of performing the intended use, then it meets the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1795

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 11-14 and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over SCHEER et al. (WO 01/16588 as a reference under 35 U.S.C. 102(b) with citations from English equivalent U.S. Patent 6,767,442 B1) in view of SUGIYAMA et al. (U.S. Patent 5,787,866).

a. With regards to claim 11, SCHEER et al. discloses a sensor element for determining a concentration of gas component in a gas mixture comprising a laminated body including a plurality of solid electrolyte layers, the plurality of solid electrolyte layers including an upper layer (11a, FIG. 1) a lower layer (11d, FIG. 1) and an intermediate layer (11b, FIG. 1), each of the upper and lower layers including a ceramic film (line 55-57, column 2 “ceramic foil”), the intermediate layer including at least one film binder layer (line 59-65, column 2 “ZrO₂”).

SCHEER et al. does not appear to explicitly disclose a sensor element wherein the upper and lower layers are of equal thickness. The only difference between the sensor element, as disclosed by SCHEER et al., and the invention, as claimed in claim 11 of the current application, is the specific thicknesses of the solid electrolyte layers.

However, SUGIYAMA et al. discloses a sensor element and discloses an upper ceramic zirconia solid electrolyte layer (210, FIG. 2) and a lower ceramic zirconia solid

electrolyte layer (110, FIG. 2) which are equal in thickness (line 54-57, column 5 and line 64, column 5). As, made evident by SUGIYAMA et al., the thickness of the upper and lower ceramic zirconia solid electrolyte layers are conventionally designed with equal thicknesses.

Thus, at the time of the invention, it would have been obvious to a person having ordinary skill in the art to modify the sensor element, as disclosed by SCHEER et al., to include designing the upper and lower solid electrolyte layers to be of equal thickness, as disclosed by SUGIYAMA et al., because the design of the upper and lower solid electrolyte layers to be equal in thickness is a conventional technique in the art that one with ordinary skill would have expected success in the combination.

b. With regards to claim 12, independent claim 11 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers wherein the sensor element is structurally capable of determining a concentration of oxygen in an exhaust gas of an internal combustion engine (line 13-16, column 1). Regarding claims which contain various process or intended use limitations, such as “for determining a concentration of oxygen in an exhaust gas of an internal combustion engine” which do not further delineate the structure of the claimed apparatus from the structure of the prior art, because these claims are drawn to an apparatus statutory class of invention, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus itself. These recited process or use limitations are accorded no patentable

weight to an apparatus. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is Capable of performing the intended use, then it meets the claim.

c. With regards to claim 13, independent claim 11 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers wherein the at least one film binder layer is disposed on one of the films for the upper and lower layers (line 60-61, column 2 & see 11b, FIG. 1). Regarding claims which contain various process or intended use limitations, such as “printed” which do not further delineate the structure of the claimed apparatus from the structure of the prior art, because these claims are drawn to an apparatus statutory class of invention, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus itself. These recited process or use limitations are accorded no patentable weight to an apparatus. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is Capable of performing the intended use, then it meets the claim.

Art Unit: 1795

d. With regards to claim 14, independent claim 11 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers wherein the at least one film binder layer is composed of a zirconium oxide paste (line 59-65, column 2).

e. With regards to claim 17, independent claim 11 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers wherein the upper layer includes a gas entry hole (25, FIG. 1) that completely penetrates the upper layer. Regarding claims which contain various process or intended use limitations, such as “that is made before a lamination of the laminated body” which do not further delineate the structure of the claimed apparatus from the structure of the prior art, because these claims are drawn to an apparatus statutory class of invention, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus itself. These recited process or use limitations are accorded no patentable weight to an apparatus. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is Capable of performing the intended use, then it meets the claim.

f. With regards to claim 18, dependent claim 17 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers further comprising a pump cell having an outer and inner pump electrode (23 & 20, FIG. 1 respectively) situated on a solid electrolyte, and a Nernst cell having a Nernst electrodes and a reference electrode (21 & 22, FIG. 2 respectively) situated on a solid electrolyte, and wherein the upper layer forms the solid electrolyte of the pump cell (11a, FIG. 1) and the intermediate layer forms the solid electrolyte of the Nernst cell (11b, FIG. 2).

g. With regards to claim 19, dependent claim 18 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers further comprising a diffusion barrier (27, FIG. 2) structurally capable of connecting the inner pump electrode and the Nernst electrode with the gas entry hole.

h. With regards to claim 20, dependent claim 18 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers further comprising a reference gas duct (15, FIG. 2) that is charged with a reference gas, and that is in connection with the reference electrode, the reference gas duct being filled with porous material (line 46-56, column 3).

Art Unit: 1795

- i. With regards to claim 21, independent claim 11 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers further comprising an electrical resistance heater (40, FIG. 1) embedded in an insulating layer (41, FIG. 1) and situated between the lower layer (11d, FIG. 1) and the intermediate layer (11b, FIG. 1).
8. Claims 15 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over SCHEER et al. (WO 01/16588 as a reference under 35 U.S.C. 102(b) with citations from English equivalent U.S. Patent 6,767,442 B1) in view of SUGIYAMA et al. (U.S. Patent 5,787,866), as applied to claims 11-14 and 17-21, and in further view of TATSUMOTO et al. (U.S. Patent 6,537,431 B1) and SHOJI et al. (WO 00/39572 as a reference under 35 U.S.C. 102(b) with citations from English equivalent U.S. Patent 6,589,410 b1).

- a. With regards to claims 15 and 16, independent claim 11 is obvious over SCHEER et al. in view of SUGIYAMA et al. under 35 U.S.C. 103(a) as discussed above. The combination of SCHEER et al. and SUGIYAMA et al. discloses a sensor element comprising upper, intermediate, and lower solid electrolyte layers.

The combination of SCHEER et al. and SUGIYAMA et al. does not appear to explicitly disclose a sensor element wherein the upper and lower solid electrolyte layers are 0.55mm and the thickness of the intermediate layer is 50 microns. The only difference between the sensor element, as disclosed by the combination of SCHEER et al. and SUGIYAMA et al., and the invention, as claimed in claims 15 and 16 of the current application, is the specific thickness of the solid electrolyte layers.

However, TATSUMMOTO et al. discloses a sensor element and discloses upper and lower solid electrolyte layers (215 & 21, FIG. 8) and an intermediate layer (235, FIG. 8) of a binder (line 52, column 5 “organic binder”) being 50 microns thick (line 33, column 6 “ t_0 is approximately 50 μm ” and 235, FIG. 8). SHOJI et al. discloses a sensor element and discloses an upper and lower solid electrolyte layer (60 and 61, FIG. 10) made of zirconia that is 0.5mm in thickness (line 33-44, column 8). As made evident by TATSUMMOTO et al. and SHOJI et al., solid electrolyte layers and binder intermediate layers are conventionally designed with these thicknesses in the art.

Thus, at the time of the invention, it would have been obvious to a person having ordinary skill in the art to modify the sensor element, as disclosed by the combination of SCHEER et al. and SHOJI et al., to include designing the upper, lower, and intermediate ceramic zirconia solid electrolyte layers with certain thicknesses, as disclosed by TATSUMMOTO et al. and SHOJI et al., because the thicknesses of the solid electrolyte layers are conventionally designed as such in the art as one with ordinary skill would have expected success in the combination.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUSTIN Q. DAM whose telephone number is (571)270-5120. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

dd

June 20, 2008

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795